What is claimed is:

1. An optical communication apparatus, comprising:

a first plurality of optical communication path segments interconnected in a loop, said first plurality of optical communication path segments carrying a plurality of optical signals, each of said plurality of optical signals being at a respective one of a plurality of wavelengths;

a second plurality of optical communication path segments; and

a plurality of add/drop multiplexers, said plurality of add/drop multiplexers being arranged in a plurality of groups, each of said plurality of groups of add/drop multiplexers being coupled to a respective one of said second plurality of optical communication path segments, each of said plurality of optical signals carrying data associated with a corresponding one of said plurality of groups of add/drop multiplexers.

2. An optical communication apparatus in accordance with claim 1, further comprising:

a plurality of transfer elements each of which respectively coupling adjacent ones of said first plurality of optical communication path segments, one of said plurality of transfer elements receiving a first one of said plurality of optical signals at a first wavelength and modulated with first data associated with a first one of said plurality of groups of add/drop multiplexers, said one of said plurality of transfer elements supplying said first one of said plurality of optical signals to one of said first plurality of optical communication path segments, said one of said plurality of transfer elements further receiving a second one of said plurality of optical signals at said first wavelength and modulated with second data associated with a second one of said plurality of groups of

add/drop multiplexers, and outputting said second one of said plurality of optical signals to thereby supply said second data to said second one of said plurality of groups of add/drop multiplexers.

3. An optical communication apparatus in accordance with claim 2, wherein each of said plurality of transfer elements comprises an optical add/drop multiplexer.

4. An optical communication apparatus in accordance with claim 1, wherein each of said plurality of add/drop multiplexers comprises a synchronous optical network (SONET) add/drop multiplexer.

5. An optical communication apparatus in accordance with claim 1, wherein each of said plurality of add/drop multiplexers comprises OC-12 SONET add/drop multiplexers.

6. An optical communication apparatus in accordance with claim 1, further comprising:

a plurality of transfer elements coupling successive ones of said first plurality of optical communication path segments, one of said plurality of transfer elements receiving a first one of said plurality of optical signals at a first one of said plurality of wavelengths and modulated with first data associated with a first one of said plurality of groups of add/drop multiplexers, said one of said plurality of transfer elements supplying said first one of said plurality of optical signals to one of said first plurality of optical communication path segments, said one of said plurality of transfer elements further receiving a second one of said plurality of optical signals at a second one of said plurality of wavelengths and modulated with second data associated with a second one of said plurality of groups of add/drop multiplexers, and outputting said second one of said

plurality of optical signals to thereby supply said second data to said second one of said plurality of groups of add/drop multiplexers.

7. An optical communication apparatus in accordance with claim 6, wherein each of said plurality of transfer elements comprises an optical add/drop multiplexer.

8. An optical communication apparatus, comprising:

a looped optical communication path including first and second optical communication path segments;

third and fourth optical communication path segments;

a first plurality of add/drop multiplexers being coupled to said third optical communication path segment;

a second plurality of add/drop multiplexers coupled to said fourth optical communication path segment;

an optical add/drop multiplexer having a first input and a first output, said first input being coupled to said first optical communication path segment and said first output being coupled to said second optical communication path segment, said first optical communication path segment carrying a first plurality of optical signals, each at a respective one of a first plurality of wavelengths, said second optical communication path segment carrying a second plurality of optical signals, each at a respective one of a second plurality of wavelengths;

a first optical receiver having an input port coupled to a second output of said optical add/drop multiplexer and an output port coupled to said third optical communication path segment, said first optical receiver sensing one of said first plurality

of optical signals carrying first information associated with said first plurality of add/drop multiplexers and outputting first electrical signals in response thereto;

a first optical transmitter coupled to said first optical receiver, said first optical transmitter supplying first light modulated in accordance with said first information to said third optical communication path segment;

a second optical receiver coupled to said fourth optical communication path segment, said second optical receiver sensing second light carrying second information associated with said second plurality of add/drop multiplexers and outputting a second electrical signal in response thereto; and

a second optical transmitter configured to supply one of said second plurality of optical signals modulated in accordance with said second information to a second input of said optical add/drop multiplexer, said optical add/drop multiplexer supplying said one of said second plurality of optical signals to said second optical communication path segment via said second output of said optical add/drop multiplexer.

9. An optical communication apparatus in accordance with claim 8, wherein said first and second pluralities of wavelengths are the same and a wavelength of said one of said first plurality of optical signals is the same as a wavelength of said one of said second plurality of optical signals.

10. An optical communication apparatus in accordance with claim 8, wherein a wavelength of said one of said first plurality of optical signals is different than a wavelength of said one of said second plurality of optical signals.

11. An optical communication apparatus in accordance with claim 8, wherein each said first and each said second plurality of transfer elements comprises a SONET add/drop element.

12. An optical communication apparatus in accordance with claim 8, wherein each of said first and second pluralities of add/drop multiplexers comprises OC-12 SONET add/drop multiplexers.

13. An optical communication apparatus in accordance with claim 8, wherein successive ones of said second plurality of add/drop multiplexers contribute respective data portions of said second information.

14. An optical communication apparatus in accordance with claim 1, wherein each add/drop multiplexer within one of said plurality of groups successively contributes information collectively constituting data associated with said one of said plurality of groups of add/drop multiplexers.

15. A communication method, comprising the steps of:

transmitting a plurality of optical signals along a first optical communication path segment, each of said plurality of first optical signals being at a respective one of a plurality of wavelengths;

extracting one of said plurality of first optical signals from said first optical communication path segment;

supplying a second optical signal to a second optical communication path segment in response to said one of said plurality of first optical signals;

extracting data constituting at least a portion of information carried by said second optical signal at a plurality of locations provided along said second optical communication path segment.

16. A method in accordance with claim 15, wherein a wavelength of said one of said plurality of first optical signals is different than a wavelength of said second optical signal.

17. A method in accordance with claim 15, wherein a wavelength of said one of said plurality of first optical signals is substantially the same as a wavelength of said second optical signal.

18. A communication method, comprising the steps of:

successively modulating a first optical signal at a plurality of locations along a first optical communication path;

supplying a second optical signal to a second optical communication path based on said modulated first optical signal; and

supplying a plurality of additional optical signals to said second optical communication path, each said second optical signal and said additional plurality of optical signals being at a respective one of a plurality of wavelengths.

19. A communication method, comprising the steps of:

supplying a plurality of first optical signals to a first optical communication path segment, each of said plurality of first optical signals being at a respective one of a plurality of wavelengths;

successively modulating a second optical signal at a plurality of locations along a second optical communication path segment, said second optical signal being modulated in accordance with first data associated with said plurality of locations;

extracting one of said plurality of first optical signals from said first optical communication path segment, said one of said plurality of first optical signals carrying second data;

passing remaining ones of said plurality of first optical signals from said first optical communication path segment to a third optical communication path segment;

adding a third optical signal to said third optical communication path segment in response to said second optical signal; and

supplying a fourth optical signal to a fourth optical communication path segment in response to said extracted one of said plurality of first optical signals.

20. A method in accordance with claim 19, further comprising the step of sensing portions of data carried by said fourth optical signal at respective locations along said fourth optical communication path.

21. A method in accordance with claim 19, wherein a wavelength of said one of said plurality of first optical signals and a wavelength of said third optical signal are substantially the same.

22. A method in accordance with claim 19, wherein a wavelength of said one of said plurality of first optical signals and a wavelength of said third optical signal are different.

23. A method in accordance with claim 19, wherein said first and third optical communication paths constitute portions of a looped optical communication path.